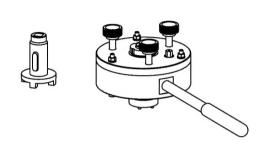
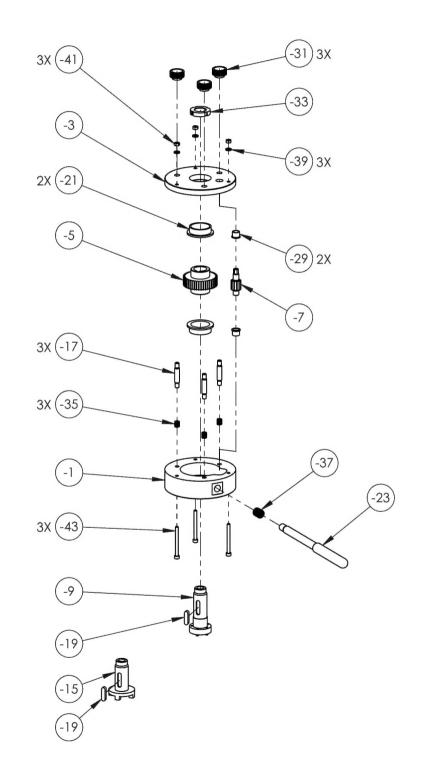
		REVISIONS								
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED					
1		RELEASED FOR PRODUCTION.	7/29/2016	DPD	JAG					
2	17-0006	-5, -7, -11, -15 CH'D MATERIAL WAS 4140/4142 Q&T IS 4140/4142, ADDED HEAT TREAT RC 28-3411, -15 CH'D DIM WAS .317/.315 IS .318/.316 (S.F19), -13 ADDED DIMS Ø.3140/.3135, .0819 CH'D QTY. WAS I IS 2, CH'D FINISH WAS QMSI-6.2.2 REV D IS QMSI-6.2.2, B.O. REV D23 CH'D ENGRAVE NOTE WAS INK STAMP "RBEM653V3005121-23" IS LASER ENGRAVE "RBEM653V3005121-23"25 CH'D DIM WAS Ø.63 IS Ø.62.	4/14/2017	RJC	JAG					



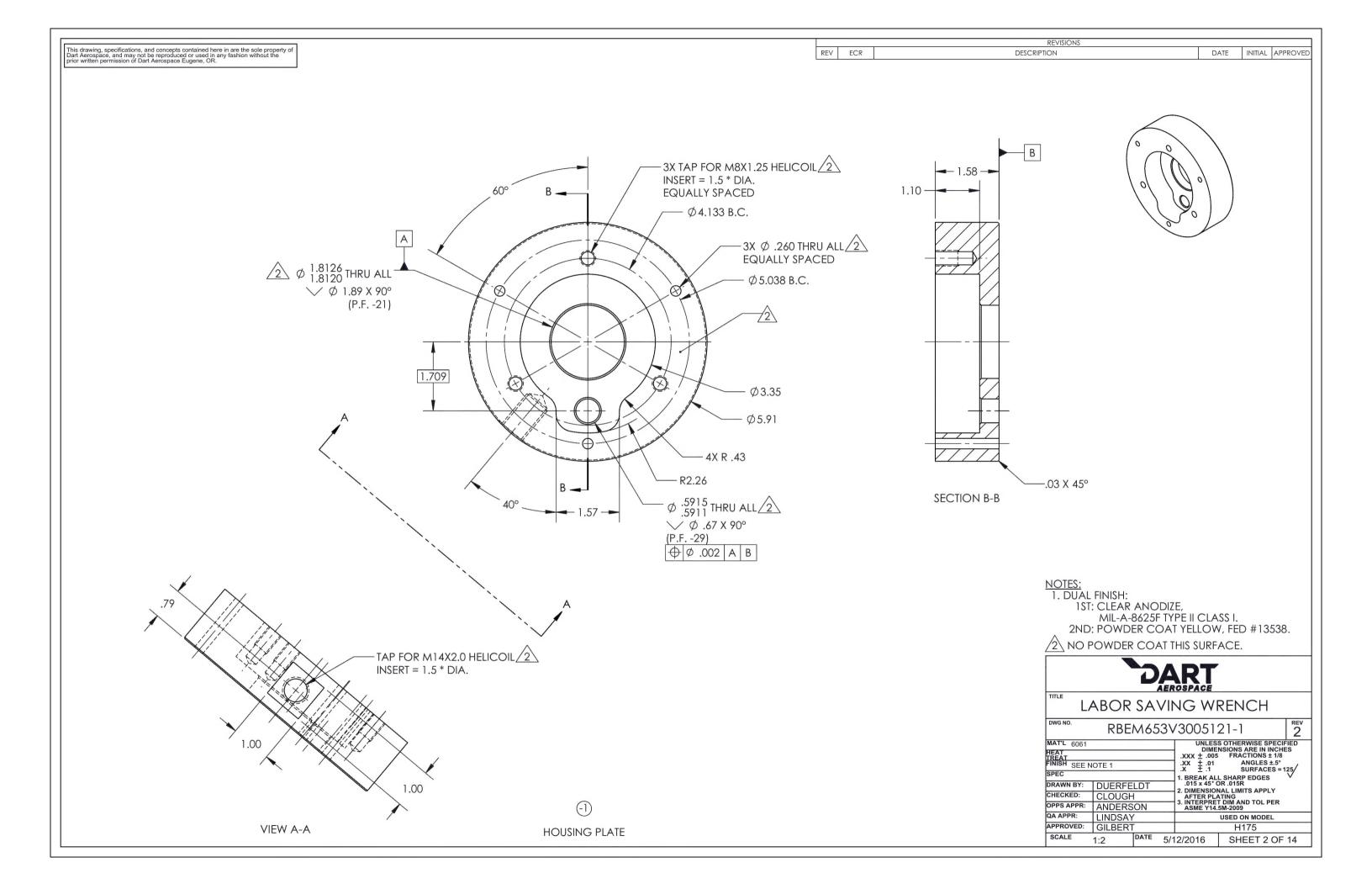
ASSY QTY	ASSY QTY	B/O	Part #	UNIT	Description	Material	B/O INFORMATION OR SPECIFICATIONS	PG.
			-1	1	HOUSING PLATE	6061		2
			-3	1	COVER PLATE	6061		3
			-5	1	46 TOOTH GEAR	4140/4142		4
			-7	1	12 TOOTH GEAR	4140/4142		5
	Χ		-9	1	WRENCH HEAD ASSEMBLY			6
	1		-11		WRENCH HEAD	4140/4142		7
	5		-13		WRENCH HEAD PIN	O-1		8
			-15	1	LOCK SCREW WRENCH HEAD	4140/4142		9
			-17	3	THREADED ROD	4140/4142		10
			-19	2	KEY	STEEL	7mm X 8mm (MCMASTER-CARR #92288A740) MODIFIED	11
			-21	2	FLANGED SLEEVE BEARING	SAE 660	Ø40mm I.D. X Ø46mm O.D. X 20mm (MCMASTER-CARR #5448T29) MODIFIED	12
Χ			-23	1	HANDLE ASSEMBLY			13
1			-25		HANDLE	4140/4142		14
1		B/O	-27		HANDLE GRIP	BLACK VINYL	Ø5/8 I.D. X 4-7/8 (MCMASTER-CARR #97065K38)	13
		B/O	-29	2	FLANGED SLEEVE BEARING	SAE 841	Ø12mm I.D. X 15mm O.D. X 12mm (\$YMMCO #\$FM-12X15X12X18X1.5)	1
		B/O	-31	3	KNURLED NUT	STEEL	M8 X 1.25mm (J.W. WINCO #8NF45/A)	1
		B/O	-33	1	SPANNER NUT	STEEL	M24 X 1.5mm (J.W. WINCO #240X\$NB)	1
		B/O	-35	3	HELICAL INSERT	S.S.	M8 X 1.25mm X 12mm (MCMASTER-CARR #91000A069)	1
		B/O	-37	1	HELICAL INSERT	S.S.	M14 X 2mm X 21mm (MCMASTER-CARR #91732A671)	1
		B/O	-39	3	WASHER	STEEL	M6 (MCMASTER-CARR #91166A250)	1
		В/О	-41	3	HEX NUT	STEEL	M6 X 1mm (MCMASTER-CARR #90591A151)	1
		B/O	-43	3	SOCKET HEAD CAP SCREW	STEEL	M6 X 1mm X 65mm (MCMASTER-CARR #91502A177)	1

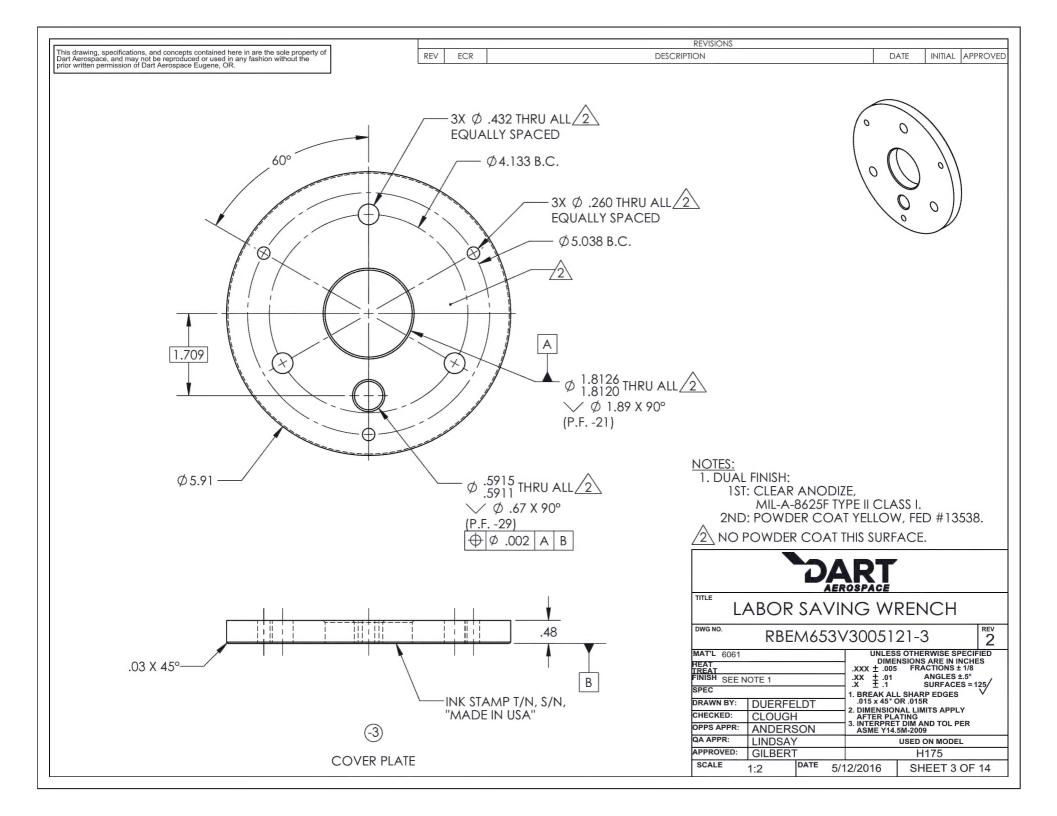


- NOTES:
 1. REF. AIRBUS T/N: M653V3005121.
 2. PART OF KIT RBEM653V3005101.
 3. GREASE INTERNAL PARTS.

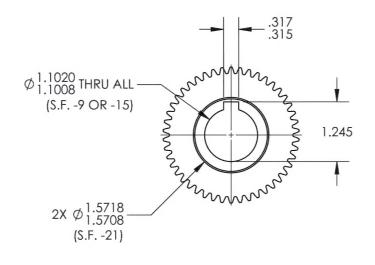
LABOR SAVING WRENCH

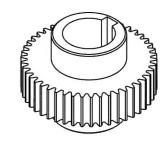
RBEM653				V3005	2	
MAT'L HEAT TREAT FINISH			DIME	S OTHERWISE SPECIF NSIONS ARE IN INCHE FRACTIONS ± 1/8 ANGLES ±.5°	s	
SPEC				.X ± .1 SURFACES = 125/ 1. BREAK ALL SHARP EDGES .015 x 45° OR .015R - 2. DIMENSIONAL LIMITS APPLY		
DRAWN BY:						
CHECKED:	CLOUGH	1		AFTER PLATING		
OPPS APPR:	OPPS APPR: ANDERSON			3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009		
QA APPR: LINDSAY			USED ON MODEL			
APPROVED: GILBERT SCALE 1:6 DATE 5/12		H175		H175		
		2/2016	SHEET 1 OF	14		

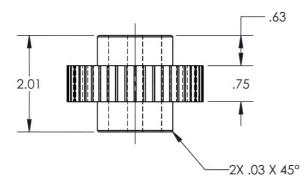




	REVISIONS							
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED			
2	17-0006	-5 CH'D MATERIAL WAS 4140/4142 Q&T IS 4140/4142, ADDED HEAT TREAT RC 28-34.	4/14/20107	RJC	JAG			







GEAR CUTTING DATA					
No. OF TEETH	46				
DIAMETRAL PITCH	16.943				
PRESSURE ANGLE	20°				
PITCH DIAMETER	2.715				
MAJOR DIAMETER	2.833				
MINOR DIAMETER	2.567				
ADDENDUM	.059				
CHORDAL TOOTH THICKNESS	.093				
FILLET RADIUS	.023				
MEASUREMENT OVER PINS	2.863				
PIN DIAMETER	.107				

(-5) 46 TOOTH GEAR

DART

LABOR SAVING WRENCH

DWG NO.	RBEM653	3V3005121-5	REV 2
MAT'L 4140/	4142	UNLESS OTHERWISE SPEC	
HEAT_ RC 28	3-34	DIMENSIONS ARE IN INCH	

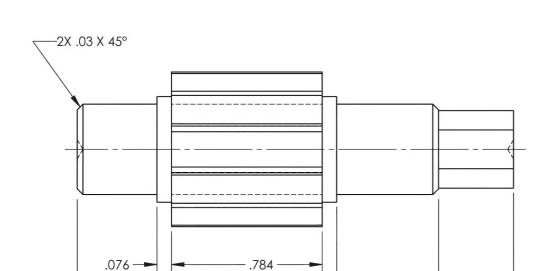
DIMENSIONS ARE IN INCHES		
.XXX ± .005 FRACTIONS ± 1/8		
.XX ± .01 ANGLES ±.5° .X ± .1 SURFACES = 125/		
1. BREAK ALL SHARP EDGES		
.015 x 45° OR .015R 2. DIMENSIONAL LIMITS APPLY		
AFTER PLATING		
3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009		
USED ON MODEL		
H175		
5/12/2016 SHEET 4 OF 14		

REVISIONS .							
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED		
2	17-0006	-7 CH'D MATERIAL WAS 4140/4142 Q&T IS 4140/4142, ADDED HEAT TREAT RC 28-34.	4/14/2017	RJC	JAG		

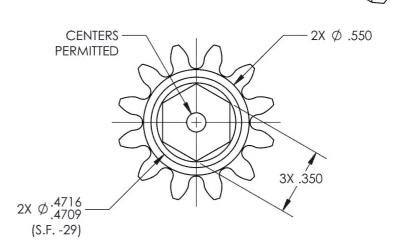
APPROVED:

SCALE

GILBERT



2.27 -



GEAR CUTTING DATA					
No. OF TEETH	12				
DIAMETRAL PITCH	16.943				
PRESSURE ANGLE	20°				
PITCH DIAMETER	.708				
MAJOR DIAMETER	.826				
MINOR DIAMETER	.561				
ADDENDUM	.059				
CHORDAL TOOTH THICKNESS	.087				
FILLET RADIUS	.023				
MEASUREMENT OVER PINS	.852				
PIN DIAMETER	.107				

-7 12 TOOTH GEAR

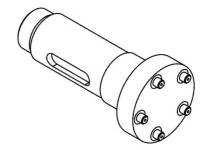
DART							
TITLE	NG WRENCH						
DWG NO.	RBEM653V	V3005121-7					
MAT'L 4140/4	142	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES					
TREAT RC 28	-34	.XXX ± .005 FRACTIONS ± 1/8 .XX + .01 ANGLES ± .5° .X ± .1 SURFACES = 125/					
FINISH ZINC	PLATE						
SPEC ASTM	B633 TYPE I SC 2	1. BREAK ALL SHARP EDGES					
DRAWN BY:	DUERFELDT	.015 x 45° OR .015R					
CHECKED:	CLOUGH	2. DIMENSIONAL LIMITS APPLY AFTER PLATING					
OPPS APPR:	ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009					
QA APPR:	LINDSAY	USED ON MODEL					

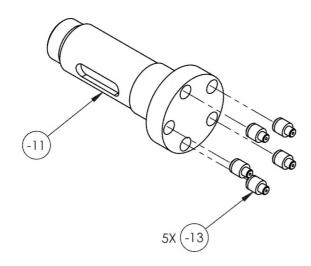
DATE 5/12/2016

H175

SHEET 5 OF 14

REVISIONS							
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED		







TITLE

LABOR SAVING WRENCH

DWG NO.

RBEM653V3005121-9

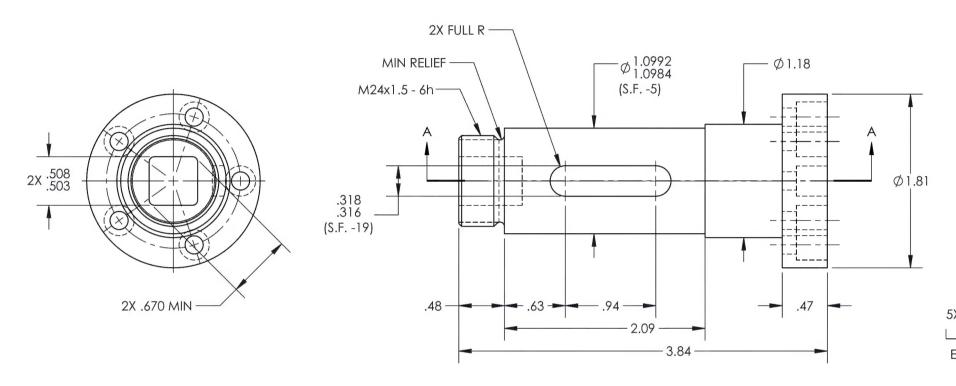
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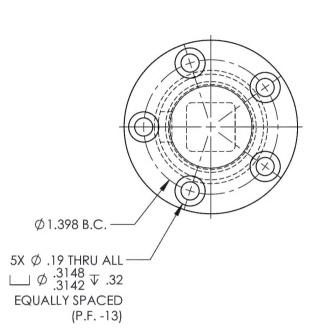
	NDL	14100	, O V	30031	Z 1 - /	2		
MAT'L				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES XXX + .005 FRACTIONS ± 1/8				
HEAT TREAT								
	FINISH ZINC PLATE				ANGLES ±.5° SURFACES = 1	25/		
SPEC ASTM	B633 TYPE	ISC 2		1. BREAK ALL SHARP EDGES				
DRAWN BY:	DUERFELDT			.015 x 45° OR .015R - 2. DIMENSIONAL LIMITS APPLY AFTER PLATING				
CHECKED:	CLOUGH							
OPPS APPR:	ANDERS	SON		3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009				
QA APPR:	LINDSAY	/			USED ON MODEL			
APPROVED:	GILBER				H175			
SCALE	1.2	DATE	5/1	2/2016	SHEET 6 OF	14		

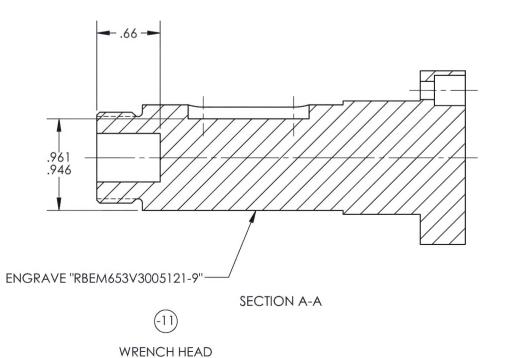
(-9)

WRENCH HEAD ASSEMBLY

	REVISIONS									
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED					
2	17-0006	-11 CH'D DIM WAS .317/.315 IS .318/.316 (S.F19), CH'D MATERIAL WAS 4140/4142 Q&T IS 4140/4142, ADDED HEAT TREAT RC 28-34.	4/14/2017	RJC	JAG					







NOTE: TIMING OF FEATURES NOT CRITICAL.

DART

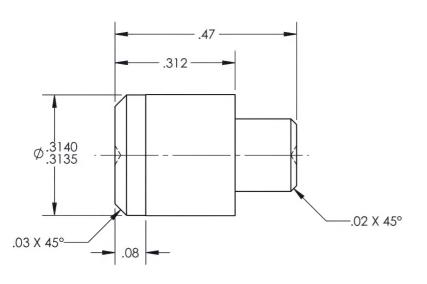
LABOR SAVING WRENCH

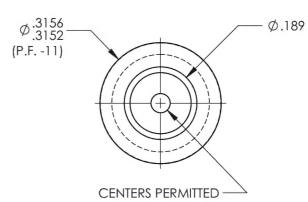
DWG NO.	RBEM653V	3005121-11	2		
MAT'L 4140/4 HEAT RC 28-		UNLESS OTHERWISE SPECIFI DIMENSIONS ARE IN INCHES .XXX ± .005 FRACTIONS ± 1/8			
FINISH SEE-9)	.XX ± .01 ANGLES ±.5° .X ± .1 SURFACES = 12			
SPEC		1. BREAK ALL SHARP EDGES			
DUERFELDT DUERFELDT		.015 x 45° OR .015R 2. DIMENSIONAL LIMITS APPLY			
CHECKED: CLOUGH		AFTER PLATING 3. INTERPRET DIM AND TOL PER			
OPPS APPR:	ANDERSON	ASME Y14.5M-2009			
QA APPR:	LINDSAY	USED ON MODEL			
APPROVED:	GILBERT	H175			

SCALE 1:1 DATE 5/12/2016 SHEET 7 OF 14

	REVISIONS								
REV	REV ECR DESCRIPTION				APPROVED				
2	17-0006	-13 ADDED DIMS Ø.3140/.3135, .08.	4/14/2017	RJC	JAG				









TITLE

LABOR SAVING WRENCH

DWG NO.

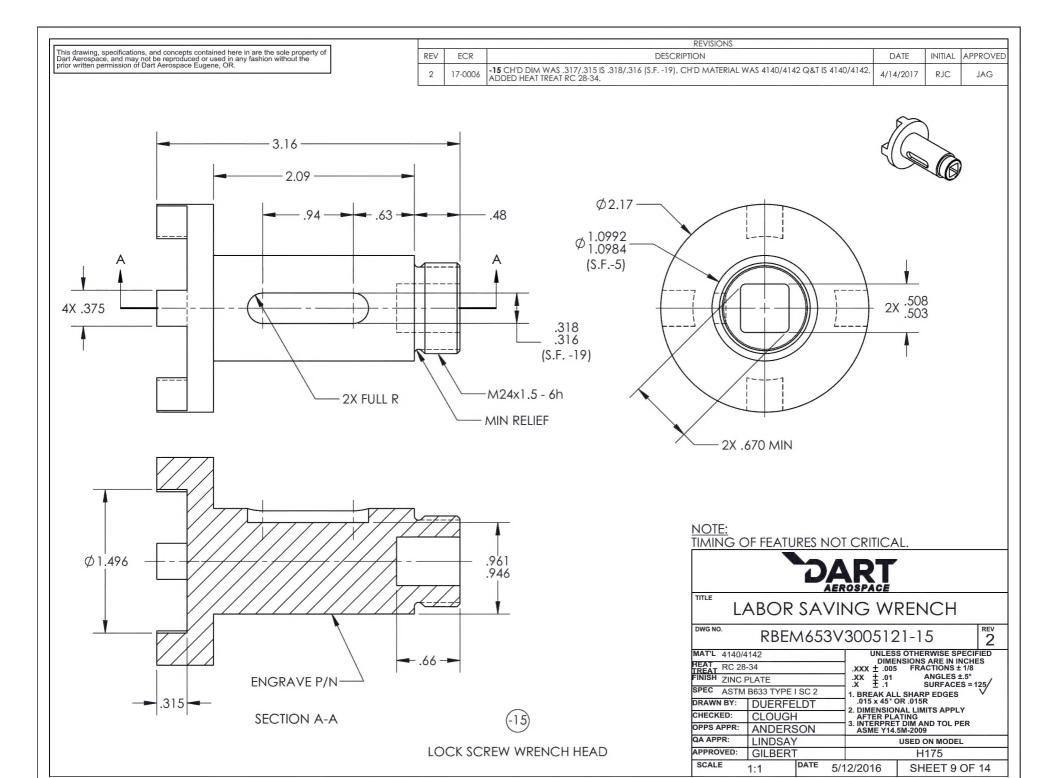
RBEM653V3005121-13

REV 2

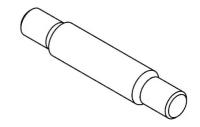
		KULI	V100	U V	000012	- '	10	_	
M	MAT'L O-1				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES				
FIE TE	HEAT RC 55-60				.xxx ± .005	ACTIONS ± 1/8	:5		
FII	NISH SEE-	9			.XX ± .01 ANGLES ±.5° .X ± .1 SURFACES =				
SF	PEC				1. BREAK AL	L SHA	RP EDGES	V	
DF	RAWN BY:	DUERFE	LDT		.015 x 45° C				
CI	HECKED:	CLOUGH	1		AFTER PLA	TING			
OI	PPS APPR:	ANDERS	SON		ASME Y14.		AND TOL PER 09		
Q/	A APPR:	LINDSAY	/			USE	ON MODEL		
AF	PPROVED:	GILBERT					H175		
S	CALE	4:1	DATE	5/1	12/2016	S	HEET 8 OF	14	

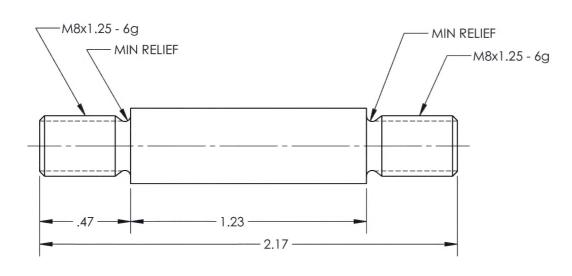
(-13

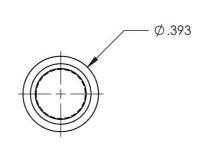
WRENCH HEAD PIN



		REVISIONS			
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED









TITLE

LABOR SAVING WRENCH

DWG NO.

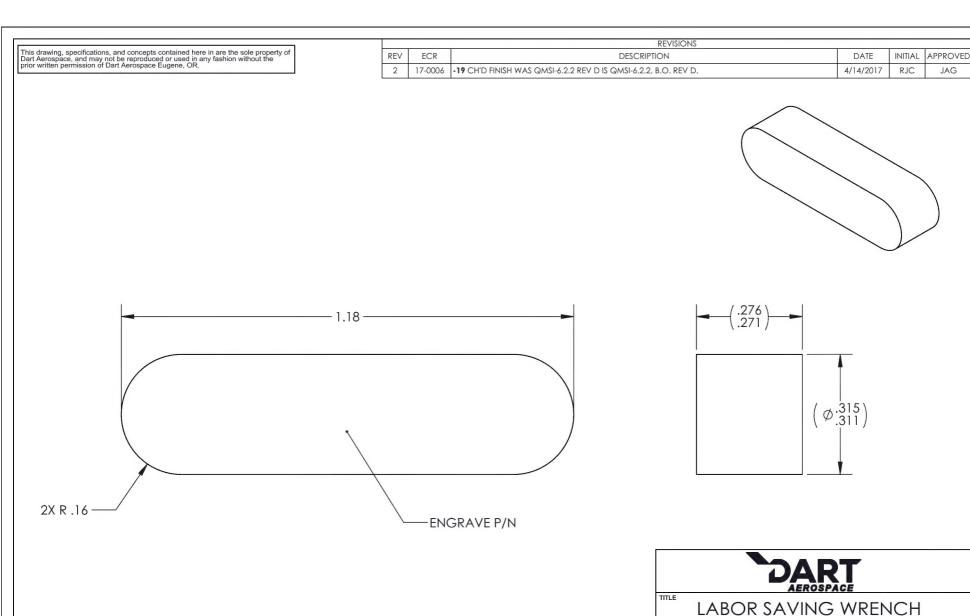
RBEM653V3005121-17

REV 2

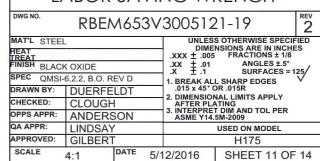
		v100.	O V	300312	-1-17	_			
MAT'L 4140/	4142			UNLESS OTHERWISE SPECIFIED					
HEAT TREAT	TREAT				DIMENSIONS ARE IN INCHES .XXX ± .005 FRACTIONS ± 1/8				
FINISH ZINC PLATE				.XX ± .01 ANGLES ±.5° .X ± .1 SURFACES = 12					
SPEC ASTM	B633 TYPE	ISC 2		1. BREAK AL	L SHARP EDGES	,			
DRAWN BY:	DUERFE	LDT		.015 x 45° C	OR .015R NAL LIMITS APPLY				
CHECKED:	CLOUGH	1		AFTER PLA	TING				
OPPS APPR:	ANDERS	SON		ASME Y14.	T DIM AND TOL PER 5M-2009				
QA APPR:	LINDSAY	/			USED ON MODEL				
APPROVED:	GILBER				H175				
SCALE	2.1	DATE	5/1	2/2016	SHEET 10 OF 1	4			



THREADED ROD

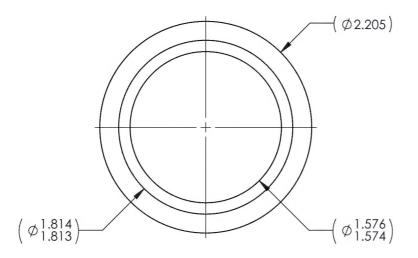


KEY

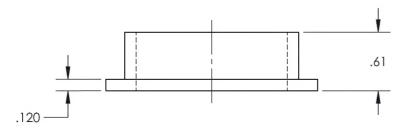


JAG

		REVISIONS REVISIONS			
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED









FLANGED SLEEVE BEARING



LABOR SAVING WRENCH

DWG NO. RBEM653V3005121-21

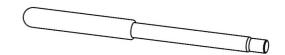
MAT'L SAE 660 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

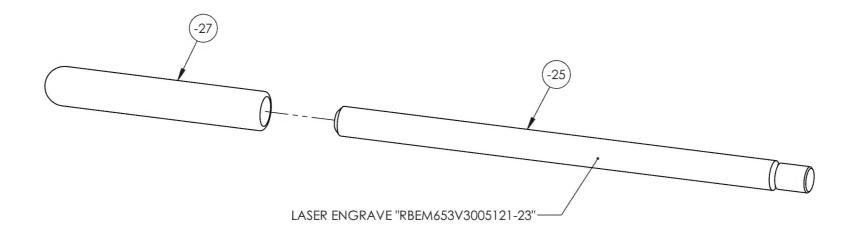
.XXX ± .005 FRACTIONS ± 1/8

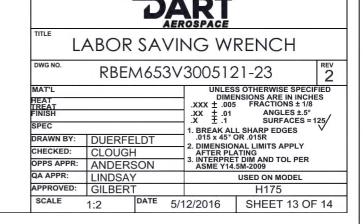
.XX + .01 ANGLES ± .5°

.X ± .1 SURFACES = 125/ SPEC 1. BREAK ALL SHARP EDGES .015 x 45 'OR .015R 2. DIMENSIONAL LIMITS APPLY AFTER PLATING 3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009 DRAWN BY: DUERFELDT CHECKED: CLOUGH OPPS APPR: ANDERSON QA APPR: LINDSAY USED ON MODEL APPROVED: GILBERT H175 SCALE 1:1 5/12/2016 **SHEET 12 OF 14**

	REVISIONS .								
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED				
2		-23 CH'D ENGRAVE NOTE WAS INK STAMP "RBEM653V3005121-23" IS LASER ENGRAVE "RBEM653V3005121-23".	4/14/2017	RJC	JAG				









HANDLE ASSEMBLY

REVISIONS This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR. ECR DESCRIPTION INITIAL APPROVED REV DATE 17-0006 -25 CH'D DIM WAS Ø.63 IS Ø.62. 4/14/2017 RJC JAG - 10.5 - $\emptyset.62$ -M14x2.0 - 6g 🖄 -.10 X 45°

NOTES:

- MIN RELIEF

1. DUAL FINISH:

1ST: ZINC PLATE, ASTM B633 TYPE I SC2. 2ND: POWDER COAT YELLOW, FED #13538.

2 NO POWDER COAT THIS SURFACE.

DART

TITLE

LABOR SAVING WRENCH

DWG NO.

RBEM653V3005121-25

REV 2

						_		
MAT'L 4140/4	142			UNLESS OTHERWISE SPECIFIED				
HEAT TREAT					DIMENSIONS ARE IN INCHES .XXX ± .005 FRACTIONS ± 1/8			
FINISH SEE N	OTE 1			.XX ± .01	ANGLES ±.5° SURFACES = 1	25/		
SPEC	SPEC				1. BREAK ALL SHARP EDGES			
DRAWN BY:	LDT		.015 x 45° C					
CHECKED:	CHECKED: CLOUGH OPPS APPR: ANDERS			AFTER PLA				
OPPS APPR:				3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009				
QA APPR: LINDSAY		1		USED ON MODEL				
APPROVED: GILBERT				H175				
SCALE	1:1	DATE	5/	2/2016	SHEET 14 OF	14		

-25

HANDLE